The New Calculation Method of Oil Products Thermal Conductivity According to the True Boiling Points Curve

B. Grigoriev
Moscow Power Engineering Iashtute (Technical University)
14 Krasnokazarmennaya Street
Moscow, 105835, Russia

G. Bogatov and I. Bogatova
Kaliningrad Technical University
1, Sovetsky Prospekt
Kaliningrad, 236000, Russia

In this paper a new calculation method for thermal conductivity of oil products (λ_{op}) with $100 \le M \le 300$ is presented. The method is based on the curve of the boiling points curve (TBP). It consists of several stages:

1. The establishment of the group hydrocarbonic structure of an oil product, i.e. the calculation of the amount of paraffinic (C_p), naftenic (C_n) and aromatic (C_a) hydrocarbons contained in the product using results of ρ-n_D-M and v-n_D -M analyses.
2. The division of the TBP-curve by N fractions depends on the mass percent selection.
3. The formation of conventional model mixtures for each fraction of three hydrocarbons: paffinic - P, naftenic – N, aromatic – A.
4. The calculation of $\lambda(T, P)_k$ of hydrocarbons of each fraction for every combination of parameters T and P is made according to a semi-empirical method [1] using the structural fragment of molecules.
5. The thermal conductivity of an oil product for a given values of T and P is calculated by the equation.

The analysis showed that the calculational error of λ_{op} for all considered oil products does not exceed 3.4%.

[1] G.F. Bogatov and B.A. Grigoriev, *High Temp. High Press.* **22**, 219 (1990).